Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of error compensation for measurements taken using a coordinate positioning apparatus comprising an articulating probe head having a surface detecting device, ~~wherein the surface detecting device is rotated about at least one axis of the articulating probe head during the measurements,~~ the method ~~comprising the following steps in any suitable order:~~ comprising:

rotating the surface detecting device about at least one axis of the articulating probe head during measurements;

~~(a)~~ determining a stiffness of a whole or a part of the coordinate positioning apparatus;

~~(b)~~ determining a load or one or more factors which relate to the load applied by a motion of the articulating probe head about ~~said~~ the at least one axis at any particular instant; and

~~(c)~~ determining a measurement error at the surface detecting device caused by the load, using data determined in ~~steps (a) and (b).~~ the determining steps.

2. (Original) A method according to claim 1 wherein the load comprises a torque.

3. (Previously Presented) A method according to claim 1 wherein the load comprises a linear force.

4. (Previously Presented) A method according to claim 1 wherein the surface detecting device is a contact probe.

5. (Previously Presented) A method according to claim 1 wherein the surface detecting device is a non-contact probe.

6. (Currently Amended) A method according to claim 1 wherein the stiffness is determined ~~in step (a)~~ by applying a load to the whole or part of the coordinate positioning apparatus and measuring a deflection.

7. (Currently Amended) A method according to claim 1 wherein the stiffness is determined ~~in step (a)~~ by:

measuring an object of known dimensions to obtain measured dimensions whilst measuring the load applied to the whole or part of the coordinate positioning apparatus;

wherein a deflection of the whole or part of the apparatus is determined based on a difference between the known and measured dimensions of the object; and

~~wherein~~ the stiffness is derived from the load and the deflection.

8. (Previously Presented) A method according to claim 7 wherein the known dimensions of the object are determined by measuring the object at a slow speed.

9. (Currently Amended) A method according to claim 1 wherein the surface detecting device is a contact probe having a workpiece contacting stylus, and wherein the stiffness is determined ~~in step (a)~~ by:

positioning the contact probe so that the workpiece contacting stylus is in contact with a surface of an object of known dimensions; and

taking measurement readings of the surface when different probe forces are applied;

wherein a deflection of the whole or part of the coordinate positioning apparatus is determined based on a difference between the known dimensions and the measurement readings; and

~~wherein~~ the stiffness is derived from the probe forces and the deflection.

10. (Currently Amended) A method according to claim 1 wherein the surface detecting device is a contact probe having a workpiece contacting stylus, and wherein the stiffness is determined ~~in step (a)~~ by:

positioning the contact probe so that the workpiece contacting stylus is in contact with a surface of an object of known dimensions;

oscillating the articulating probe head as a probe tip of the articulating probe head remains in contact with the surface; and

taking measurement readings of the surface when oscillating at different probe frequencies and hence accelerations;

wherein a deflection of the whole or part of the coordinate positioning apparatus is determined based on a difference between the known dimensions and the measurement readings; and

~~wherein~~ the stiffness is derived from the accelerations and the deflection.

11. (Currently Amended) A method according to claim 1 wherein the one or more factors which relate to the load ~~in step (b)~~ is determined based on system variables of the coordinate positioning apparatus.

12. (Currently Amended) A method according to claim 11 wherein the one or more factors which relate to the load ~~in step (b)~~ is determined based on current applied to at least one motor in the articulating probe head.

13. (Currently Amended) A method according to claim 11 wherein the one or more factors which relate to the load ~~in step (b)~~ is determined by double differentiation of measurement data from a position measuring device in the articulating probe head.

14. (Currently Amended) A method according to claim 1 wherein the one or more factors which relate to the load ~~in step (b)~~ is determined using a torque meter or accelerometer.

15. (Currently Amended) A method according to claim 1, ~~the method~~ further comprising determining an offset of a measurement path of the surface detecting device from a datum point, and wherein the offset is used in calculating the measurement error.

16. (Currently Amended) A method according to claim 15, wherein the measurement error ~~determined in step (c)~~ is substantially proportional to $(L\cos\varphi)\delta\theta$, wherein L is a distance from the datum point, the datum point being in the articulating probe head, to the measurement path of the surface detecting device, φ is an angle between the surface detecting device and an axis normal to an axis of a structure onto which the articulating probe head is mounted and $\delta\theta$ is an angular deflection of the structure onto which the articulating probe head is mounted.

17. (Previously Presented) A method according to claim 16, wherein the surface detecting device is a contact probe and L is the distance between a tip of the surface detecting device and a center of rotation.

18. (Currently Amended) A coordinate positioning apparatus ~~comprising~~ comprising:

an articulating probe head having a surface detecting device, ~~wherein~~ the surface detecting device ~~is~~ being rotatable about at least one axis of the articulating probe head, a stiffness of a whole or a part of the coordinate positioning apparatus being known;

a determining unit that determines ~~the coordinate positioning apparatus being provided with means to determine~~ one or more factors which relate to a load applied by a motion of the articulating probe head about said at least one axis at any particular instant; and

~~and wherein the coordinate positioning apparatus includes~~ a processor configured to determine a measurement error at the surface detecting device caused by the load, using the known stiffness of the whole or part of the coordinate positioning apparatus and the determined one or more factors relating to the load.